

**REMARKS**

Claims 1 to 3 are presently pending in the subject patent application, and stand rejected under 35 U.S.C. §103(a). Claim 1 has been amended, claims 2 and 3 have been cancelled, and new claims 4 to 27 added. Attached is a marked-up version of the changes made to the above-noted claim(s) by the current amendment.

In the Office Action, the Examiner rejected the invention recited in claims 1 to 3 under 35 U.S.C. §103(a) for being obvious in view of Ferstenberg (US 5,873,071) as modified by Abu El Ata (US 6,311,144). The Applicant submits that the invention recited in independent claim 1, as amended, and new independent claim 3, patentably distinguishes over the combined teachings of Ferstenberg and Abu El Ata.

**METHOD OF ORDER MATCHING (CLAIM 1)**

Independent claim 1 of the subject patent application, as amended herein, recites a method of matching orders. The method involves first receiving an order definition defined with an evaluation heuristic. The evaluation heuristic identifies at least one transaction instance, such that each transaction instance identifies an order, a transaction destination and a time instant for the order with the transaction destination.

At the time instant associated with one of the transaction instances, an order message is transmitted over a communications network to the transaction destination associated with the transaction instance. The order message identifies the order associated with the transaction instance. The time instant, the order and the transaction destination of the transaction instance are determined in accordance with the evaluation heuristic.

Subsequently, a completion message identifying the completion status of the order at the transmitted transaction destination is received over the communications network. The order message transmission and the completion message reception steps are repeated in accordance with the completion status and the evaluation heuristic.

#### **FERSTENBERG (US 5,873,071)**

Ferstenberg discloses a method of matching orders between participants of a common commodity exchange. As the patentee discloses at column 12, line 60 to column 13, line 47 of the patent, the method begins with the participants advising their e-agents 1 of the criteria for a satisfactory final exchange of commodities of interest. [The e-agents 1 are processes which can execute on the participant's computer 49, or on an intermediary computer 40; column 16, lines 21 to 40.] The e-agents 1 then transmit an opening message to an electronic intermediary 3

executing on the intermediary computer 40, identifying the maximum and minimum amounts of each commodity the participant is prepared to buy or sell. From this information, the electronic intermediary 3 presents each e-agent 3 with an initial offer, constructed by allocating to each e-agent 3 a share of the total commodities.

A series of rounds of electronic negotiations ensues, in which each e-agent 1 transmits a counter-offer back to the electronic intermediary 3, and receives from the electronic intermediary 3 further such offers. Preferably, each offer from the electronic intermediary 3 is determined in a manner which attempts to balance the quantity of commodities exchanged against allocation fairness (column 15, lines 23 to 30). Also, preferably each participant supplies the e-agent 1 with an objective function of the amounts of commodities the participant wishes to exchange, and the e-agent generates counter-offers in a manner which attempts to maximize the objective function (column 14, lines 57 to 64). Alternately, each participant can supply the e-agent 1 with a series of "heuristic" rules for evaluating offers and generating counter-offers (column 17, lines 60 to 63). After a series of such rounds, the offers and counter-offers typically converge, and the participants exchange the commodities according to the amounts negotiated.

OBVIOUSNESS RE CLAIM 1

FERSTENBERG

In order to make out a *prima facie* case of obviousness in view of a primary reference, there must be some suggestion or motivation in the prior art to modify the reference to obtain the invention claimed. Further, persons of ordinary skill must have a reasonable prospect of successfully modifying the primary reference to achieve the claimed invention. As the Applicant will explain, not only is the requisite motivation for the modification of Ferstenberg lacking, but the hypothetical purpose of ordinary skill would have no reasonable prospect of successfully modifying Ferstenberg to achieve the invention claimed.

At paragraph 2 of the Office Action, the Examiner stated that at column 23, line 3 of the patent, Ferstenberg discloses that a "time" is scheduled to evaluate the heuristic. The Examiner's statement is somewhat misleading. At column 22, lines 6 to 55 of the patent, Ferstenberg explains that the heuristic rules are used to place bounds on the value of  $d_n$  (the current demand for a commodity), in a manner that balances the competing requirements of rapid convergence, maximum commodity exchange and overall fairness. The more rapidly the bound decreases, the more rapid the convergence. However, the more rapid the convergence, the less likely that a maximum commodity exchange is achieved. Consequently, at column 22,

lines 56 to 61 of the patent, Ferstenberg explains that the heuristic rules should be chosen so that the bound decreases at an intermediate rate.

More particularly, at column 23, lines 1 to 9 of the patent, Ferstenberg goes on to explain that since the optimum rate of convergence for a commodity will vary with the commodity, the heuristic for that commodity should be chosen to maximize the commodity exchange within the "time constraint" required to attain the desired rate of convergence. For example, the patentee discloses that since convergence for an equity should occur in no more than 90 seconds, the heuristic rule for such a commodity should be chosen so as to maximize the total commodity exchange within that time constraint. In other words, Ferstenberg discloses that the offers and counter-offers should continue for a specified length of time (eg. 90 seconds), and that the heuristic rules attempt to maximize the number of commodity exchanges which occur during that length of time. Ferstenberg does not disclose that the heuristic rules should be evaluated at a particular instant in time. Consequently, the step of evaluating heuristics disclosed by Ferstenberg does not correspond to the step of transmitting an order message at a specified time instant, as recited in independent claim 1 of the subject patent application..

Also, at paragraph 2 of the Office Action, the Examiner stated that at column 23, lines 35 to 46 of the patent, Ferstenberg discloses that an order message is created for communication to a transaction destination if the evaluation heuristic

matches the order. This statement is incorrect. The discussion at column 23, lines 35 to 46 of the patent merely states that the offer and counter-offer messages specify the commodity name and amount for sale or purchase. As discussed above, Ferstenberg explains that the heuristic rules merely place bounds on the value of  $d_n$  (the current demand for a commodity). As the patentee discloses at column 21, lines 14 to 65 of the patent, these bounds places limits on the quantity of the commodity offered at each stage of the negotiation. The heuristics are not used for the purpose of order matching. Consequently, the step of creating order messages disclosed by Ferstenberg does not correspond to the step of transmitting an order message at a time instant specified by an evaluation heuristic, as recited in independent claim 1 of the subject patent application.

#### MODIFICATION OF FERSTENBERG

From the foregoing discussion, it will be apparent that in order to sustain a *prima facie* obviousness rejection of the invention recited in independent claim 1, there must be some motivation or suggestion to modify Ferstenberg to define orders using an evaluation heuristic that identifies the transaction destination and the time instant for the order. In Ferstenberg, no transmission time for the order message is defined. Also, since the only A transaction destination@ is the electronic intermediary 3, the offer and counter-offer messages only specify the commodity

name and amount for sale or purchase (see column 23, lines 35 to 46).

Also, there must be some motivation or suggestion to modify Ferstenberg to transmit order messages at the time instant specified by the evaluation heuristic. In Ferstenberg, order messages are transmitted at any time within the time period during which convergence should occur.

As the Applicant will now explain, the requisite suggestion or motivation for these modifications is lacking.

Evaluation Heuristic that identifies Transaction Destination and Time Instant for the Order

Abu El Ata (US 6,311,144) discloses a method and system for designing and analyzing information system software. As the patentee explains at column 2, lines 1 to 41, and column 4, lines 1 to 67 of the patent, the system includes an input module 16, a construction module 18, a performance metrics module 24 and an output module 26. Using the input module 16, the designer inputs descriptive data 12 that describes the data, transactions, processes and architecture for the proposed information system (see column 4, lines 1 to 14). The input module 16 passes the descriptive data 12 to the construction module 18, which generates an initial model 20 of the information system. The construction module 18 also generates models 22 of the information system, for comparison purposes.

The construction module 18 passes the models 20, 22 to the performance metrics module 24, which calculates performance metrics for the models 20, 22, based on performance aspects of the information system, such as response time for completion of a transaction. The performance metrics module 24 passes the calculated performance metrics to the output module 26. The output module 26 displays the hardware/software components 54, 58 of each model 20, 22, and their corresponding performance metrics. The designer then selects one of the models 20, 22, based on the displayed performance metrics data, or selects hardware/software components 54, 58 and requests that additional models 22 be generated based on the hardware/software components 54, 58 selected.

At paragraph 2 of the Office Action, the Examiner stated that at column 1, line 45 to column 2, line 67, Abu El Ata discloses that the use of evaluation heuristics. Given the length of the passage cited, the Applicant is unable to identify the element the Examiner considered to be an evaluation heuristic. The Applicant notes that at column 2, and at column 5, lines 25 to 30 of the patent, Abu El Ata discloses that the performance metrics module 24 calculates performance metrics for the models 20, 22, based on performance aspects of the information system, such as response time for completion of a transaction. However, the performance metrics in Abu El Ata do not correspond to the evaluation heuristics recited in independent claim 1 of the subject patent application. The performance metrics in Abu El Ata



merely evaluate the performance of a proposed system after the system has been modelled, whereas the evaluation heuristics recited in independent claim 1 define when and where future orders should be placed. The performance metrics do not allow the designer to specify when and where the system should be modelled.

The Applicant notes that at column 2, and at column 5, lines 1 to 53, Abu El Ata discloses that the designer selects descriptive data describing the proposed system, and the hardware/software components 54, 58 to be used when modelling the proposed system. However, neither of these latter inputs allow the designer to specify when and where the proposed system should be modelled.

Even more importantly, at column 4, lines 15 to 38 of the patent, Abu El Ata discloses an embodiment in which the descriptive input 12 provides a description of the business process of a stock exchange. This latter passage merely describes the data to be used for a conventional stock exchange, and fails to describe any data field which would identify the time instant at which the stock order should be placed or the name of the stock exchange at which the order should be placed. This discussion is important for two reasons. First, it reveals that Abu El Ata does not suggest making use of an evaluation heuristic which specifies the time instant and location at which a transaction order should be placed. Secondly, it reveals that Abu El Ata, an inventor (a person of more than ordinary skill), when faced the application of an information system designing/testing software to a stock exchange,

failed to recognize that the conventional stock exchange methodology could be modified by making use of such an evaluation heuristic. Consequently, Ferstenberg, as modified by Abu El Ata, would not suggest to the person of ordinary skill the use of an evaluation heuristic which defines the time instant and transaction destination for placement of an order.

Order Message Transmission at Time Instant specified by the Evaluation Heuristic

As discussed above, Ferstenberg fails to disclose that the heuristic rules should be evaluated at a particular instant in time, or that offers or counter-offers should be transmitted at a particular instant in time. Rather, in Ferstenberg, order messages are transmitted at any time within the time period during which convergence should occur. Also, Ferstenberg fails to disclose that the offer and counter-offer messages can be routed to servers other than the electronic intermediary 3. Indeed, since the electronic intermediary 3 is in effect a stock exchange, routing the offer and counter-offer messages to other servers would render the embodiment taught by Ferstenberg in operative.

Abu El Ata does not suggest transmitting the data to the construction module 18 or the performance metrics module 24 or the output module 26 at a predetermined instant in time. Abu El Ata does not suggest allowing the designer to specify the route the data should take between the modules 16, 18, 24, 26.

Rather, Abu El Ata only discloses that data should move from the input module 16 to the construction module 18 to the performance module 24 to the output module 26. Indeed, altering the flow of data from the route described would lead to an inoperative embodiment. Consequently, Ferstenberg, as modified by Abu El Ata, would not suggest to the person of ordinary skill transmitting an order message, at a time instant defined in an evaluation heuristic, to a transaction destination defined in the evaluation heuristic.

### **SUMMARY**

Summarizing the foregoing, Ferstenberg does not disclose defining orders using an evaluation heuristic that identifies the transaction destination and the time instant for the order. In Ferstenberg, no transmission time for the order message is defined. Also, since the only "transaction destination" is the electronic intermediary 3, the offer and counter-offer messages only specify the commodity name and amount for sale or purchase. Abu El Ata fails to suggest making use of an evaluation heuristic which specifies the time instant and location at which a system should be modelled. Consequently, the combined teachings of Ferstenberg and Abu El Ata would not suggest to the person of ordinary skill the use of an evaluation heuristic which defines the time instant and transaction destination for placement of an order.

Also, Ferstenberg fails to disclose that offers or counter-offers should be transmitted at a particular instant in time. Rather, in Ferstenberg, order messages are transmitted at any time within the time period during which convergence should occur. Ferstenberg also fails to disclose that the offer and counter-offer messages can be routed to servers other than the electronic intermediary 3. Abu El Ata fails to suggest transmitting the data to the construction module 18 or the performance metrics module 24 or the output module 26 at a predetermined instant in time. Abu El Ata does not suggest allowing the designer to specify the route the data should take between the modules 16, 18, 24, 26. Consequently, the combined teachings of Ferstenberg and Abu El Ata would not suggest to the person of ordinary skill transmitting an order message, at a time instant defined in an evaluation heuristic, to a transaction destination defined in the evaluation heuristic.

Accordingly, the Applicant submits that the Examiner has failed to sustain a *prima facie* obviousness rejection of the invention recited in independent claim 1 of the subject patent application. Accordingly, the Applicant requests that the Examiner's obviousness rejection of claim 1 be withdrawn.

#### **ORDER MATCHING SYSTEM (CLAIM 10)**

Independent claim 10 of the subject patent application recites a computer-

based order matching system which substantially corresponds in scope to the method of order matching recited in independent claim 1. Accordingly, the Applicant submits that the invention recited in independent claim 10 patentably distinguishes over the art cited by the Examiner.

**ORDER MATCHING SYSTEM (CLAIM 16)**

Independent claim 16 of the subject patent application recites a computer-based order matching system which also substantially corresponds in scope to the method of order matching recited in independent claim 1. Accordingly, the Applicant submits that the invention recited in independent claim 16 patentably distinguishes over the art cited by the Examiner.

**COMPUTER-READABLE MEDIUM (CLAIM 22)**


Independent claim 22 of the subject patent application recites a computer-readable medium carrying processing instructions which substantially correspond in scope to the method of order matching recited in independent claim 1. Accordingly, the Applicant submits that the invention recited in independent claim 22 patentably distinguishes over the art cited by the Examiner.

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**Application No.:** 09/770,108

For the above reasons, Applicant respectfully asserts that the presently claimed invention is patentable over the prior art. Reconsideration and allowance of the claims is respectfully requested.

Respectfully submitted,

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**37 CFR §1.121(b)(1)(iii) and (c)(1)(ii)**  
**CLAIM AMENDMENTS - MARKED UP VERSION**

1. (Amended) A method of matching orders [for a user according to an evaluation heuristic], comprising the steps of:
  - a) [selecting an evaluation heuristic] receiving an order definition defined with an evaluation heuristic, the evaluation heuristic identifying at least one transaction instance, each said transaction instance identifying an order, a transaction destination and a time instant for the order with the transaction destination;
  - b) [scheduling a time to execute the selected evaluation heuristic] at the time instant associated with one of the transaction instances, transmitting over a communications network to the associated transaction destination an order message identifying the associated order; the time instant, the order and the transaction destination of the one transaction instance being determined in accordance with the evaluation heuristic;
  - c) [executing the selected evaluation heuristic;
  - d) creating an order message for communication to a transaction destination if the selected evaluation heuristic matches the order] receiving over the communications network a completion message identifying a completion status of the order at the transmitted transaction destination; and
  - d) repeating steps b) and c) in accordance with the completion status and the evaluation heuristic
  - e) repeating steps a) through d) until the order is fulfilled].